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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/057,143	01/25/2002	Fabio Casati	10008149-1	2469

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HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, CO 80527-2400

EXAMINER

DESHPANDE, KALYAN K

ART UNIT	PAPER NUMBER
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3623

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/19/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/057,143	CASATI ET AL.	
	Examiner	Art Unit	
	Kalyan K. Deshpande	3623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 15-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Introduction

1. The following is a final office action in response to the communications received on October 4, 2006. Claims 15-25 are now pending in this application.

Response to Amendments

2. Applicants' amendments to claims 17 and 19-22 are acknowledged. Applicants' cancellation of claims 1-14 is acknowledged. Examiner acknowledges new claims 23-25. Examiner withdraws the previously asserted claim objection as necessitated by amendment.

Response to Arguments

3. Applicants' arguments filed on October 4, 2006 have been fully considered but are not found persuasive. Applicants argues i) Hagan fails to teach "predicting" exceptions, ii) Hagan fails to teach an exception prediction model based on data prepared from past workflow executions, and iii) Hagan fails to teach using a model to generate a prediction for an instance of a workflow.

In response to Applicants' argument Hagan fails to teach "predicting" exceptions, Examiner respectfully disagrees. Hagan explicitly teaches the use of historical information of workflow executions in order to determine where exceptions occur and the adjusting the workflow model to account for occurring exceptions (see pp. 948-953 and 956). These steps of analyzing previous executions to account for future exception occurrences are the same thing as predicting the exceptions. Applicants misconstrue Hagan to only refer to the detection and handling of exceptions to occur after the

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detection of an exception. Hagan explicitly teaches the use of past workflow executions to modify a model detecting and handling exceptions for future workflow executions (see pp. 948-953 and 956).

In response to Applicants' argument Hagan fails to teach an exception prediction model based on data prepared from past workflow executions, Examiner respectfully disagrees. Hagan explicitly teaches preparing exception prediction model based on data prepared from past workflow executions (see pp. 948-953 and 956). Specifically, Hagan discloses modifying an existing workflow model in order to account for predicted exceptions (see pp. 948-953). In order to account for the exceptions, the programmer must determine a method to handle the exceptions (see pp. 948-953). This is the same as modeling the exceptions.

In response to Applicants' argument Hagan fails to teach using a model to generate a prediction for an instance of a workflow, Examiner respectfully disagrees. Hagan explicitly teaches the use of historical information of workflow executions in order to determine where exceptions occur and the adjusting the workflow model to account for occurring exceptions, and finally using this modified model to predict when and where on a workflow process the exception will occur (see pp. 948-953 and 956). Furthermore, Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

Claim Rejections - 35 USC § 102

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4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 15-16, 20, and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Hagen et al. (Hagen, Claus; Alonso, Gustavo; "Exception Handling in Workflow Management Systems, *IEEE Transactions on Software Engineering*, October 2000).

As per claim 15, Hagen et al. teaches:

A method for predicting exceptions in a workflow instance comprising the steps of:

a) preparing data from past workflow executions (see pp. 949 and 956; where a hardware or software detect errors in attribute information on completed or continuing processes. Furthermore, historical data is analyzed to determine necessary exception handling.);

b) generating at least one exception prediction model based on the prepared data (see pp. 949 and 956; where a modular design of an exception handling procedure is developed. Also, exception handling processes are determined by using historical data.); and

c) using the exception prediction model to generate at least one prediction of an exception for a current instance of the workflow (see pp. 944 and 956; where

exception errors are anticipated for workflow systems and contingency plans are set for to account for these failures.).

As per claim 16, Hagen et al. teaches:

The method of claim 15 wherein exception prediction includes the steps of building a process analysis table for a process definition of interest (see pp. 950-951, 953-955, figures 2 and 6-9, and tables 1 and 2; where processes and tasks are graphically depicted showing the flow of the process.);

adding labeling information to the process analysis table (see pp. 950-951, 953-955, figures 2 and 6-9, and tables 1 and 2; where elements on the figure are labeled.); and

generating classification rules by employing data mining techniques (see pp. 950-951, 953-955, figures 2 and 6-9, and tables 1 and 2; where each exception is categorized and specific handlers are set to handle each exception.).

As per claim 20, Hagen et al. teaches:

The method of claim 15 wherein the at least one prediction is reported to a workflow management system (WfMS) so that the WfMS alters the execution of processes to try to avoid the exception (see pp. 956; where processes are altered or corrected for exceptions that are likely to occur.).

6. Claims 23-25 are rejected under 35 U.S.C. 102(a) as being anticipated by Casati et al. (Casati, Fabio; Grigori, Daniela; Dayal, Umesh; Shan, Ming-Chan; "Improving Business Process Quality through Exception Understanding, Prediction, and Prevention", *Proceedings of the 27th VLDB Conference*, 2001).

As per claim 23, Casati teaches:

A method of predicting exceptions in a workflow process, comprising:

Analyzing data during execution of a workflow process to generate classification rules for plural stages of the workflow process (see pp. 4-7; where mining techniques are used to analyze workflow process data to generate classification rules for a plurality of phases.);

Generating prediction rule for the plural stages to generate a probability of an exception in the workflow process (see pp. 8-10; where a prediction rule is determined for each phase of the workflow process. The prediction rule is for predicting the probability that an exception will occur.); and

When the probability exceeds a threshold, then performing an action during execution of the workflow process to avoid the exception (see p. 9; where when the probability exceeds a threshold, the exception rule is stored in a warnings table. A user is alerted when an exception is predicted to occur and the user can take action to prevent or minimize the damage caused by the exception.).

As per claim 24, Casati teaches:

The method of claim 23 further comprising: constructing a process analysis tables for each of the plural stages to generate the classification rules (see pp. 5-7; where process analysis tables for each phase are used to determine classification rules.).

As per claim 25, Casati teaches:

The method of claim 23 further comprising: using data mining techniques to generate the classification rules (see p. 7; where data mining techniques are used to generate classification rules.).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hagen et al. (Hagen, Claus; Alonso, Gustavo; "Exception Handling in Workflow Management Systems, *IEEE Transactions on Software Engineering*, October 2000).

As per claim 21, Hagen et al. teaches:

The method of claim 15 further comprising:
reporting classification rules to a user (see p 956; where history information, including exception errors and which exception errors (classification rules) have occurred is accessible to users of the system.).

Hagen et al. fail to explicitly teach "selectively removing input data to refine classification rules" and "re-generating the classification rules by employing data mining techniques". Hagen et al. do teach logging relevant information and data in order to refine classification rules (see p. 956; where historical data is used to refine the procedures for error handling.). The logging of only relevant information is the same as "selectively removing input data". The advantage of using only relevant data or

selectively removing data used to determine classification rules is that using only relevant data increases accuracy of the statistics of the probability of exception handling to occur. It would have been obvious, at the time of the invention, to one of ordinary skill in the art to combine the steps of "selectively removing input data to refine classification rules" and "re-generating classification rules by employing data mining techniques" with the taught elements by Hagen et al. of logging only relevant information and data to redefine classification rules in order to increase the accuracy of the statistics of the probability of exception handling to occur, which is a goal of Hagen et al. (see p. 956).

9. Claims 17-19 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hagen et al. (Hagen, Claus; Alonso, Gustavo; "Exception Handling in Workflow Management Systems, *IEEE Transactions on Software Engineering*, October 2000) in view of Chiu et al. (Chiu, Dickson K. W.; Li, Qing; Karlapalem, Kamalakar; "Web Interface-Driven Cooperative Exception Handling in ADOME Workflow Management System", *Information Systems*, 2001).

As per claim 17, Hagen fails to explicitly teach "classification rules are generated for each stage in a process and are stored in a repository". Chiu et al. teach "the classification rules generated for each stage in a process are stored in a repository" (see pp. 97-98; where the system uses an object-oriented database to store objects and to store the exception rules.). The advantage of storing the rules in a repository is that it enables the increase of efficiency by enabling the reuse of the classification rules. It would have been obvious, at the time of the invention, to one of ordinary skill in the art

to store classification rules for each stage of the process in a repository in order to increase the system efficiency by enabling the reuse of classification rules, which is a goal of Chiu et al. (see p. 93).

Claim 18 recites limitations already addressed by the rejections of claims 15 and 16; therefore the same rejections apply to this claim.

As per claim 19, Hagen et al. teaches:

The method of claim 18 wherein at least one prediction is stored in a repository; wherein the prediction stored in the repository includes the exception being predicted and an indication of an accuracy of the prediction (see p.956; where the probability of exceptions are determined. If an exception occurs too often, it is incorporated in the natural process flow.).

Claim 19 further recites limitations already addressed by the rejections of claims 15 and 17; therefore the same rejections apply to this claim.

As per claim 22, Hagen et al. teaches:

The method of claim 21 wherein when the classification rules are satisfactory to the user, storing the classification rules in a database (see p. 956; where a modeler can revisit the exception handling procedures and improve the execution of processes using historical data. This is the same as the rules being satisfactory to the modeler.).

Claim 22 further recites limitations already addressed by the rejection of claim 17; therefore the same rejection applies to this claim.

Conclusion

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10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following are pertinent to the current invention, though not relied upon:

Casati et al. (Casati, Fabio; Ceri, Stefano; Paraboschi, Stefano; Guiseppe, Pozzi; "Specification and Implementation of Exceptions in Workflow Management Systems", *ACM Transactions on Database Systems*, September 1999) teaches designing workflow exception rules and their implementation in workflow systems.

Luo et al. (Luo, Zongwei; Sheth, Amit; Kochut, Krys; Miller, John; "Exception Handling in Workflow Systems", *Applied Intelligence*, 2000) teaches the handling of exceptions in workflow systems.

Casati et al. (Casati, F.; Fugini, M.G.; Mirbel, I.; "An Environment for Designing Exceptions in Workflows", *Information Systems*, 1998) teaches the incorporation of exceptions in to designing workflow schema.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kalyan K. Deshpande whose telephone number is (571)272-5880. The examiner can normally be reached on M-F 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tariq Hafiz can be reached on (571) 272-6729. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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TARIQ R. HAFIZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3300